1997 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM DIGEST

Awards

1996 MICROWAVE CAREER AWARD
Dr. Ralph Levy

The Microwave Career Award is the highest honor bestowed by MTT-S. It recognizes an individual for a lifetime career of meritorious service and technical excellence in the field. Our honored recipient is Dr. Ralph Levy, an internationally recognized independent consultant for microwave passive components and an IEEE Fellow.

The award consists of a plaque, a certificate, and an honorarium of $2,000. The Career Award Citation reads: "FOR A CAREER OF INNOVATION IN THE SYNTHESIS OF COMPLEX MICROWAVE PASSIVE COMPONENTS."

Ralph Levy (SM'64, F'73) received his B.A. and M.A. degrees in Physics from Cambridge University England in 1953 and 1957, respectively, and the Ph.D. in Applied Sciences from London University in 1966.

From 1953 to 1959, he was with GEC, Stanmore, where he worked on a variety of systems and waveguide components. In 1959 he joined Mullard Research Laboratories, Redhill, and continued research and development on microwave components and systems. Then from 1964 until 1967 he was a member of the faculty at Leeds University.

He emigrated to the USA in 1967, and was with Microwave Development Laboratories, Natick, Mass. as Vice President of Research until 1984 when he moved to California to join KW Microwave, San Diego, CA., as V.P. Engineering.

After a short period with Remec Inc., he became an independent Consultant in July 1989, and works with several companies on a wide variety of projects, mainly in the field of passive components.

Dr. Levy is the author of more than 60 papers, 2 books, and 12 patents. He has been involved in many MTT Society activities, including Editor of the *IEEE Transactions on Microwave Theory and Techniques* during 1986-88. He has been Chairman of the Central New England and San Diego MTT Chapters, Technical Program Committee Chairman for the 1983 IMS and Vice-Chairman of the Steering Committee for the 1994 IMS.

His most important technical contributions, evaluated mainly on the basis of being widely referenced, are in chronological order:

1961 - Invention of the Digital IFM System. 1963 - Exact Synthesis of Asymmetric Coupled-Transmission-Line Directional Couplers. 1964 - Explicit formulas for Broadband Matching Networks. 1965 - Synthesis of Distributed Lowpass Filters. 1965 - Generalized Kuroda Transformations. 1967 - Theory of Direct-Coupled Cavity Filters. 1968 - Synthesis of Branch-Guide Directional Couplers (with L.F. Lind). 1968 - Synthesis of Multi-Aperture Directional Couplers (improved in 1980 with field averaging over the coupling apertures). 1970 - Introduction of Zolotarev Functions with Microwave Circuit Applications. 1970 - Design of Mixed Lump and Distributed Networks. 1973 - Generalized Design of Distributed Ladder Networks. 1973 - Tapered Corrugated Waveguide Lowpass Filters. 1976 - Filters Having Single Extra Cross Couplings. 1979 - Generalized Multiplexer Theory (with J. D. Rhodes). 1984-88 - Synthesis of Inhomogeneous Distributed Networks. 1994 - Synthesis of Singly Terminated Cross Coupled Filters. 1995 - Direct Synthesis of Cascaded-Quadruplet Filters. 1995 - Simple theory of Dual-Mode Cavity Coupling.

1996 PIONEER AWARD
Dr. Ali E. Atia and Dr. Albert E. Williams

The Pioneer Award recognizes contributions that have had a major impact on the microwave engineering field and have stood the test of time. The basis of nomination is an archival paper in the field of interest of MTT-S, published at least 20 years prior to the year of the award.

Dr. Ali E. Atia and Dr. Albert E. Williams are the recipients this year of the Pioneer award. They developed the dual-mode cavity filter at COMSAT Laboratories which has been widely used for multiplexers and filters requiring high selectivity in a limited volume.

Each award consists of a plaque and an honorarium of $1,000. The citations read: "FOR THE INVENTION OF THE DUAL-MODE CAVITY FILTER, A MAJOR ADVANCE IN THE DEVELOPMENT OF SATELLITE COMMUNICATIONS."

In the late 1960's, it was recognized that the most efficient way to design a satellite payload with a large communications capacity was to divide the allocated 500 MHz frequency band into a large number of narrowband transponders, each with its own non-linear power amplifier. In 1968, this could only be achieved with bulky waveguide Chebycheff filters. For example, the INTELLSAT IV payload contained twelve, 10-pole filters of 36 MHz bandwidth, each weighing approximately 2200 grams. A significant filter weight reduction was needed in order to increase the number of channels in the satellite communications systems without adding extra payload.

Dr. Atia and Dr. Williams solved this problem by developing the dual mode cavity filter in which a single cavity could support two electrical resonant modes and, in addition, could generate responses with sharp selectivity and/or flat group delay. An eight-pole elliptic filter constructed in four physical cavities and weighing only 450 grams proved to be electrically equivalent to the INTELLSAT IV 10-pole Chebycheff filter and was first flown in space on the INTELLSAT IV-A communications satellite.

During the next 25 years, this original work lead directly to the development of many types of multiple coupled-cavity filters and multiplexers providing significant reduction in mass and volume for high-capacity satellite payloads. In 1991, collaboration with Lincoln Laboratory led to the development of high-temperature superconducting thin films. Both cavity and superconducting filters are now finding extensive application in the wireless industry.

Ali E. Atia (S '67, M '69, SM '78, F '87) received his B.S. Degree from Ain Shams University, Cairo, Egypt, in 1962, M.S. and Ph.D. Degrees in Electrical Engineering from the University of California, Berkeley, in 1966 and 1969, respectively. In 1994, Dr. Atia joined CTA International where he is presently President. CTA International implements turnkey satellite telecommunications and direct broadcast systems, and currently is managing the implementation of the INDOSTAR Program, a direct broadcast satellite system for the Republic of Indonesia.

Dr. Atia joined COMSAT Laboratories in 1969 where he participated in research and development of a broad range of advanced microwave technologies for communication satellite transponders and antennas. He designed, developed and implemented microwave flight hardware (mixers, filters, multiplexers, amplifiers, switches, antennas, etc.) for several satellite programs covering the L- through the Ka- frequency bands. Dr. Atia participated in and directed system development and software activities for several satellite programs and ground stations projects for customers including INTELSAT, INMARSAT, ARABSAT, and others.

Dr. Atia held several technical and management positions at COMSAT, the most recent of which was Vice President and Chief Engineer for COMSAT Technology Services and COMSAT Systems Division.

Dr. Atia is a Fellow of the IEEE, Associate Fellow of the AIAA, and a member of the Sigma Xi Research society. He has authored or co-authored over one hundred refereed technical articles and presentations in the IEEE IEEE transactions and various national and international conferences and symposia. He holds five patents in the areas of microwave filters and receivers.

Albert E. Williams (S' 66, M '66, SM '78, F '87) was born March 27, 1940, in Albany, Western Australia. He received a B.E. degree from University of Western Australia in 1962; a Ph.D. from University College, London University, in 1966; and an MBA from George Washington University in 1990. From 1966 to 1968, he was a lecturer in the Department of Electrical Engineering at the University of Western Australia. In 1969, Dr. Williams joined COMSAT Laboratories as a Member of the Technical Staff in the Transponders Department of the Microwave Technical Division. He is currently Vice President of the Satellite and Systems Technologies Division.

During his tenure at COMSAT, Dr. Williams has also made major contributions to satellite and ground system design for both the INTELSAT and INMARSAT Systems. In recent years, he has led the COMSAT Laboratories team studying the application of low earth orbit, intermediate circular orbit, and geostationary orbits for personal handheld communications.

Dr. Williams is a Fellow of the IEEE (1986), a past chairman of the MTT-S subcommittee, and a member of Sigma Xi, the Scientific Research Society. In 1966, he was joint recipient of the IEEE (London) Sylvanus P. Thompson Premium Award, and in 1984 a joint recipient of the COMSAT Research Award. He has authored/co-authored more than 50 papers and holds seven patents.

1997 MICROWAVE PRIZE

The Microwave Prize is awarded annually to the author or authors of a paper published in the IEEE Transactions on Microwave Theory and Techniques, or any other IEEE publication, that is judged to be the most significant contribution in the field of interest to the Society in the calendar year preceding that in which the selection is made.

The 1997 Microwave Prize is awarded to Ruai Y. Yu, Madhukar Reddy, Joe Pusl, Scott T. Allen, Michael Case, and Mark J. W. Rodwell for their paper entitled "Millimeter-Wave On-Wafer Waveform and Networks Measurements Using Active Probes," *IEEE Transactions on Microwave Theory and Techniques,* vol. 43, no. 4, April 1995, pp. 721-729.

Ruai Y. Yu received the B.S. degree in Electrical Engineering from San Francisco State University in 1988, the M.S. and Ph.D. degrees, both in Electrical Engineering, from the University of California at Santa Barbara in 1991 and 1994, respectively.

From 1988 to 1989 he was a research engineer at Ampex Corporation where he was engaged in the research and development of advanced equalization schemes for high-speed digital recording channels. A complete hardware and software development of an adaptive equalizer using transversal filters was successfully demonstrated. While he was a graduate student at UCSB, he developed novel high-speed integrated circuits and built systems for microwave and millimeter-wave instrumentation. He implemented on-wafer probe systems which are capable of performing waveform and network measurements up to 200 GHz. He demonstrated the world's first monolithic traveling-wave resonant tunneling diode (RTD) pulse generator and was involved in development of a novel biasing scheme for RTD oscillators.

Dr. Yu joined the High-Speed Circuits Department, Rockwell Science Center, as a member of technical staff in February, 1994, where he is now a senior scientist. His current research interests include the design and packaging of high-speed, high-resolution analog-to-digital converters, broadband integrated circuits for 40 Gbit/s optical transmission systems, and RF/microwave transceiver circuits for wireless communication applications. He has implemented numerous packaged high-speed/low-noise analog/RF integrated circuits using submicron CMOS, and advanced Si BJT, and AlGaAs/GaAs HBT technologies. Dr. Yu has authored and co-authored over 50 publications in the areas of high-speed integrated circuits and systems.

Madhukar Reddy (S '84, M '85) was born in Hyderabad, India on November 4, 1969. He received the B. Tech degree in Electronics and Communication Engineering from the Indian Institute Technology, Madras, India in June 1991. Since September, 1991, he has been a graduate student at the University of California, Santa Barbara, working in the area of high speed electronic devices and circuits and under the guidance of Professor Mark Rodwell from July 1991. He received the M.S. degree in Electrical Engineering in March 1993 and the Ph.D. in Electrical Engineering in December 1996. For his Ph.D. thesis, he developed monolithic Schottky collector resonant tunnel diode oscillator arrays for generating power at submillimeter-wave frequencies. During the summer of 1996, he worked as a summer intern at Rockwell Semiconductor Systems, Newport Beach, CA. Dr. Reddy is presently at Rockwell Semiconductor Systems, Newport Beach and is involved in the development of RF circuits for wireless applications.

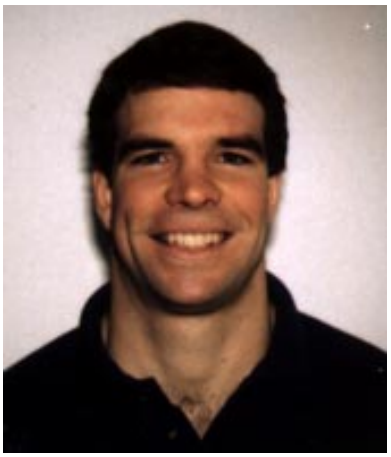
Joseph A. Pusl was born in San Diego, CA., on September 19, 1968. He

received the B.S. degree in 1990 and the M.S. degree in 1992 in Electrical Engineering, both from the University of California, Santa Barbara. His graduate emphasis was on microwave circuit design and solid state device physics and modeling.

While pursuing the M.S. degree, his research was concentrated on millimeter-wave network analysis technologies and broadband millimeter-wave MMIC designs. For mm-wave network analysis, he worked on the characterization and optimization of coplanar transmission lines for broadband applications to 200 GHz. His work on broadband (dc-100 GHz) MMICs was done in collaboration with Hughes Research Laboratories, Malibu, CA. This involved the development of active device models for InP-based HEMTs valid up to mm-wave frequencies, the determination of circuit topologies suitable for the application , and the design of low-parasitic, high-bandwidth coplanar structures.

Since July, 1992 he has been with Hughes Space and Communications Company, Los Angeles, CA. He is involved with three-terminal device development, large signal characterization, large signal modeling, MIC and MMIC design, packaging, and semiconductor reliability testing. He has developed an active harmonic loadpull system with waveform sampling capability for the large signal characterization of active devices in the frequency and time domains. He is currently working on a collaborative effort with Hughes Research Laboratories to develop a GaAs-based power pHEMT process suitable for high-efficiency applications from 1 to 20 GHz.

Scott T. Allen received his Bachelor of Science degree in 1987 from Cornell University and in 1989 received an M.S. degree from the University of Massachusetts, Amherst, where he specialized in microwave technology. In 1994 he received his Ph.D. in Electrical Engineering from the University of California at Santa Barbara, where his research focused on GaAs devices and circuits for sub-millimeter-wave applications. For his thesis project he developed a nonlinear-transmission-line-based sampling circuit that had a 3 dB bandwidth of 725 GHz.



Prior to returning to school to earn his Ph.D., Dr. Allen spent three years at Lockheed Martin's Electronics Laboratory working as a Device Engineer on the development of HEMT technology. His work there included extensive device modeling of both GaAs pHEMTs and InP HEMTs and the design of low noise MMIC amplifiers.

In 1994 he joined the research and development group at Cree Research in Durham, NC, to work on silicon carbide MESFETs for microwave power applications. Since that time he has become the principal investigator on a S-band power MESFET program and a MAFET Thrust 3 X-band power MESFET program. He also recently demonstrated the first GaN/AlGaN HEMT fabricated on a silicon carbide substrate.

Dr. Allen has authored or co-authored over 40 papers published in various conference proceedings and refereed journals. He has also been cited as a co-inventor on three patent applications pertaining to silicon carbide microwave technology.

Michael Case (S ‘88, M ‘91, S ‘91, M ‘93) was born in Ventura, California in 1966. He attended the University of California at Santa Barbara from 1984 to 1993, earning his B.S. in 1989, M.S. in 1991, and his Ph.D. in 1993. His graduate work involved ultra high speed waveform generation and measurement. The focus of this work was nonlinear transmission lines to generate picosecond electrical transitions.

Michael is currently employed at the Hughes Research Labs in Malibu, California where he is involved with GaAs-, InP- and SiGe-based device characterization and circuit design. Applications range in frequency from L-band to W-band and encompass satellite, ground terminal, RADAR, and automotive systems. Michael has authored 35 technical papers and five patent applications.

Mark J. W. Rodwell (M ‘89) was born in Altrincham, Cheshire, England in 1960. He received the B.S. degree in Electrical Engineering from the University of Tennessee, Knoxville, in 1980, and the M.S. (1982) and Ph.D. degrees (1988) in Electrical Engineering from Stanford University. From 1982 through 1984 he worked at AT&T Bell Laboratories, developing optical transmission systems. He was a research associate at Stanford University from January to September 1988.

In September 1988 he joined the Department of Electrical and Computer Engineering, at the University of California, Santa Barbara, where he is currently Professor. His current research involves submicron scaling of millimeter-wave heterojunction bipolar transistors (HBTs) and development of HBT integrated circuits for microwave receivers and fiber optic transmission systems. His group has developed deep submicron Schottky-collector resonant-tunnel diodes with THz bandwidths, and has developed monolithic submillimeter-wave oscillators with these devices. His group has worked extensively in the area of GaAs Schottky-diode integrated circuits for subpicosecond pulse generation, signal sampling at submillimeter-wave bandwidths, and millimeter-wave instrumentation. He is the recipient of a 1989 National Science Foundation Presidential Young Investigator award, and his work on submillimeter-wave diode ICs has been recognized by an invited paper in the *Proceedings of the IEEE.*

1997 DISTINGUISHED EDUCATOR AWARD

Dr. David B. Rutledge

This Award was inspired by the untimely death of Professor F. J. Rosenbaum (1937-1992), an outstanding teacher of microwave science and a dedicated MTT-S AdCom member/contributor. The award is given to a distinguished educator in the field of microwave engineering and science who exemplifies the special human qualities of the late Fred J. Rosenbaum. Fred considered teaching a high calling and demonstrated his dedication to MTT-S through tireless service.

The award consists of a plaque and an honorarium of $1,000. The awardee must be a distinguished educator, recognized, in general, by an academic career coupled to many years of service to the microwave profession. The effectiveness of the educator should be supported by a list of graduates in the field of microwave science who have become recognized in the field. The candidate shall also have an outstanding record of research contributions documented in archival publications. The candidate shall also have a record of many years of service to MTT-S.

The honored recipient of this year's award is Dr. David B. Rutledge, Professor of Electrical Engineering at the California Institute of Technology. The citation reads: "FOR LEADERSHIP IN TEACHING, RESEARCH AND IN THE MICROWAVE PROFESSION."

David B. Rutledge (M'75, S'77, M'77, S'78, M'80, SM'89, F'93) grew up in Fort Worth, Texas. He attended Williams College, in Williamstown, Massachusetts, receiving a B.A. in Mathematics in 1973, and Cambridge University, Cambridge, England, receiving an M.A. in Electrical Sciences in 1975. He worked as an Aerosystems Engineer on microwave data links for General Dynamics (now Lockheed-Martin) in Fort Worth, Texas in 1975 and 1976. He received his Ph.D. in Electrical Engineering in 1980 from the University of California, Berkeley. His advisor was Professor Steven Schwarz, and the thesis topic was *Submillimeter-Wave Integrated-Circuit Antennas and Detectors*.

Since 1980, he has been teaching at Caltech and working on microwave circuits and antennas. His research group developed key ideas in integrated-circuit antennas, including lens-coupled antennas, which appear widely in radio-astronomy receivers. His group demonstrated anisotropic etching for fabricating horns and membrane technology for suspending metal antennas. The group first described leakage from planar transmission lines, and first demonstrated many active quasi-optical components, including phase shifters, oscillators, mixers and amplifiers. Recently the group has developed Class-E HF power amplifiers for industrial and amateur use. He is co-author with Scott Wedge and Richard Compton of the widely distributed educational microwave computer-aided design package, *Puff*, with 15,000 copies worldwide.

He was a visiting scientist at CSIRO, New South Wales, Australia, in the summer of 1985, at the Research Institute for Electrical Communication, Tohoku University, Sendai, Japan, in the spring and summer of 1988, and at the National Defense Academy, Yokosuka, Japan in the fall of 1995. He has been a Distinguished Lecturer for the Antennas and Propagation Society from 1991 to 1993 and is a member of the AP-S AdCom. He was honored with the Teaching Award of the Associated Students of Caltech, and five of his students have been awarded Presidential Investigator and Career Awards.

He has served as Chairman for nineteen doctoral candidates and has authored or co-authored over 200 publications. He is an IEEE Fellow and was one of the recipients of the MTT-S Microwave Prize in 1993.

1997 DISTINGUISHED SERVICE AWARD

Mr. Vladimir G. Gelnovatch

The Distinguished Service Award is presented to honor an individual who has given outstanding service over a period of years for the benefit and advancement of MTT-S.

This year's honoree is Mr. Vladimir G. Gelnovatch, Acting Director of the Physical Sciences Directorate of the U. S. Army Research Laboratory. He served as President of MTT-S AdCom in 1989. He is an IEEE Fellow.

His Citation reads: "FOR 36 YEARS OF DILIGENT, EXCEPTIONALLY EFFECTIVE AND DISTINGUISHED SERVICE TO THE MICROWAVE THEORY AND TECHNIQUES SOCIETY AND THE MICROWAVE PROFESSION".

Vladimir G. (Walt) Gelnovatch (S'61, M'64, SM'69, F'82) is currently Acting Director of the Physical Sciences Directorate of the Army Research Laboratory. He was appointed to the position on February 3, 1995.

Prior to his appointment, Mr. Gelnovatch served as the Director of the Microwave/Lightwave Component Division, EPSD, for the past 18 years. He has additionally served as the Army Project Manager of the DARPA sponsored MIMIC and MAFET programs. He began his government career at Fort Monmouth in the Signal Corps Engineering Laboratory (SCEL).

Gelnovatch has made many significant contributions to the area of microwave/millimeter-wave components and circuits, and has authored or coauthored over 40 reports and publications. He pioneered the use of optimal seeking CAD to design microwave circuits, authoring a program called DEMON, for which he received the 1972 Army Research and Development Award. He is known for his development of microwave integrated circuits (MICs) and monolithic MICs (MMICs).

His professional affiliations include membership in the Institute of Electrical and Electronic Engineering (IEEE). He was elected a Fellow of the Institute in 1982 and served as the president of the IEEE Microwave Theory and Techniques Society in 1989. He is currently a member of the Electrical Engineering Department Industrial Advisory Board at the University of Virginia, serving since 1985, and is a Visiting Professor of Electrical Engineering there. He currently serves as an associate editor of the Microwave Journal. He was awarded the Army Meritorious Civilian Service Award in 1990. In 1974, he visited Russia on an IEEE exchange program, visiting many unclassified institutes.

He is currently the Army's Principal Member of the JDL/Defense Reliance Technology Panel for Electron Devices, and the Army member of the DoD Advisory Group on Electron Devices, serving since 1965.

Vladimir G. (Walt) Gelnovatch received a B.S. degree in Electronic Engineering from Monmouth College, West Long Branch, New Jersey in 1963, and his M.S. degree in Electrical Engineering from New York University, in 1967, including post M.S.E.E. degree work there.

Walt was born in New York City in 1938. He served in the Signal Corps in Germany from 1956 to 1959, as the Site Chief of the Holenstadt Microwave Radio Station. He resides in Manasquan, New Jersey with his wife, Dorit. They have three sons and two grandchildren.

1997 N. WALTER COX AWARD

Dr. Reynold S. Kagiwada

The N. Walter Cox award has been established in recognition of the qualities of N. Walter Cox and his service to the MTT Society prior to his untimely death in 1988. It is given to Society Volunteers whose efforts on behalf of MTT-S best exemplify their spirit and dedication.

This year's recipient is Dr. Reynold S. Kagiwada. The citation reads: "FOR EXEMPLARY SERVICE, GIVEN IN A SPIRIT OF SELFLESS DEDICATION AND COOPERATION."

Reynold S. Kagiwada (M '72, SM '79, F '89) is the Advanced Technology Manager for Microwave Technology at TRW in Redondo Beach, California. He received his B.S., M.S., and Ph.D. from the University of California at Los Angeles in 1960, 1962, and 1966 respectively. Dr. Kagiwada is responsible for coordinating internal and external technology development activities and new business for RF Products and Advanced Microelectronics. Previously, he was the Assistant Program Manager with responsibility for the fabrication, testing, assembly, and packaging of the MIMIC chips on the DARPA MIMIC Program at TRW. Prior to joining TRW in 1972, he was Assistant Professor at the University of Southern California from 1969 to 1972, and Assistant Professor in Residence at the University of California at Los Angeles from 1966 to 1969.

Dr. Kagiwada has served the MTT-S Society in a number of key positions in the microwave symposia and AdCom. He was Editor of the *MTT-S Newsletter* from 1984 to 1987, and chaired a number of AdCom committees dealing with education, budget, and long-range planning before his election as Vice- President in 1991 and MTT-S President in 1992.

Dr. Kagiwada has also been very active in the MTT-S International Microwave Symposia over the years. He served as Technical Program Chairman in 1987 and 1989, and Finance Chairman in 1994. He has served on the Steering Committee of the Microwave and Millimeter-Wave Monolithic Circuits Symposium as Local Arrangements Chairman in 1984, Vice-Chairman in 1986, Finance Chairman in 1987, Technical Program Chairman in 1988, and Chairman in 1989. Within the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, he served on their AdCom as Secretary/Treasurer from 1982 to 1988 , Publication Chairman in 1979, and Technical Program Chairman in 1983 of the IEEE International Ultrasonics Symposium.

Dr. Kagiwada holds eight patents, and is co-author of 45 technical papers. He was a Gold Medal Recipient for the 1985 TRW Ramp Technology Transfer Award and received the ESG Chairman's Award for Innovation in 1991. He is a member of Old Crows, Sigma Pi Sigma, and Sigma Xi. Dr. Kagiwada is an IEEE Fellow.

1997 IEEE FELLOW AWARDS

Twelve MTT-S members who were evaluated by our Society were elected to the grade of Fellow, effective 1 January 1997. The grade of Fellow is conferred in recognition of unusual professional distinction. It is awarded at the initiative of the IEEE Board of Directors after a rigorous nomination and evaluation process. Individuals receiving this distinction have demonstrated extraordinary contributions to one or more fields of electrical engineering, electronics, computer engineering and related sciences. This grade is not conferred automatically on nomination; only a fraction of those nominated are honored by elevation to the grade of IEEE Fellow.

Dr. H. Clark Bell	*For advancements in synthesis techniques and development of new prototype networks for microwave filters.*
Dr. Kazuhiko Honjo	*For contributions to the development of gallium-arsenide integrated circuits.*
Dr. Asher Madjar	*For contributions to large-signal modeling of MESFETs.*
Dr. Toshio Nishikawa	*For contributions to the development of microwave devices for mobile communication systems based on low-loss dielec tric ceramics.*
Dr. Anthony Michael Pavio	*For developments in broadband active and passive GaAs monolithic mixers, and for contributions to microwave circuit technology.*
Prof. Roger David Pollard	*For contributions to the development of microwave and millimeter-wave measurements, and active device characterization.*
Prof. Gabriel M. Rebeiz	*For the development of novel microwave and millimeter-wave antennas, receivers and circuits using micromachining techniques.*
Dr. Saad Michael Saad	*For contributions to the analysis, design and development of waveguide components.*
Prof. Alwyn John Seeds	*For contributions to the development of microwave photonic devices and systems.*
Dr. Richard V. Snyder	*For contributions to the development of high power miniature stopband filters and extremely wideband bandpass filters for microwave applications.*
Dr. T.C.L. Gerhard Sollner	*For pioneering the development of resident-tunneling structures and contributions to the understanding of high-speed semiconductor devices.*
Dr. Cheng Paul Wen	*For contributions to the invention and the development of coplanar waveguide based microwave integrated circuit and monolithic microwave integrated circuit techniques.*

The following eleven new Fellows are also MTT-S members but were evaluated by other IEEE Societies.

Dr. Trevor S. Bird	*For contributions to the theory of mutual coupling between antennas with particular application to the design of array feeds for satellite antennas.*
Dr. Francis Xavier Canning	*For developing efficient and stable numerical computation methods for solving electromagnetic problems.*
Prof. Ioan Matei R. Ciric	*For contributions to modeling and analysis of magnetic devices.*
Dr. Jeannine Henriette Henaff	*For contributions to the analysis, design and realization of telecommunication systems.*
Prof. Karl Joerg Langenberg	*For contributions to acoustoelastic and microwave imaging.*
Prof. Dennis Paul Nyquist	*For contributions to the theory of open-boundary waveguides and wideband radar.*
Mr. Zong Sha	*For technical leadership in radiowave-propagation research, practice, and education.*
Dr. Donald Hugh Sinnott	*For contributions to the development of computational electromagnetics and technological leadership of defense research and development in Australia.*
Mr. Robert Chastain Smythe	*For contributions to the theory and technology of crystal filters, resonators, and monolithic filters.*
Mr. Michael T. Tuley	*For contributions to radar cross section reduction technology and education.*
Dr. Kane Shee-Gong Yee	*For contributions in computational electromagnetics including finite difference time domain analysis.*